Regional knowledge transfer between university and health sectors: production, transmission and reception

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Knowledge Transfer Between the University and Health Sectors

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EXECUTIVE SUMMARY

The Research

The remit of this research was to examine the dynamics of knowledge transfer (KT) between universities and the health sector, with specific reference to research-based activity. The full report is based on a literature review on knowledge transfer and policy analysis of current Government thinking in this area, as well as over 50 interviews with commissioners and funders of research in a range of NHS organisations and university managers and researchers, conducted between April and October 2005.

Report Structure

This report is an edited version of the full report, funded by Trent SHA, which is available on the SURF web site (www.surf.salford.ac.uk). It is divided into two sections. Following an introduction and description of the research itself, the second section of the report argues that there is a missing 'how to' of knowledge transfer, compounded by inadequate levels of co-ordination, conceptions of KT and targeted funding. This executive summary provides an overview of the full report findings.

Full Report Summary

KT is regarded as the transfer of ideas, practices and skills between entities to facilitate and strengthen links between them. Given the idea of the 'knowledge economy', KT is seen as essential for economic growth and productivity. Government and funders rigorously claim to support the transfer of knowledge, but this implicitly refers to university-industry collaborations. With an increased Government emphasis on joint and inter-sectoral working, non-industry and university sectors are encouraged to participate in KT, but face an absence of 'know-how' which is not solved by a simple resort to IT solutions. In practice terms, knowledge is meaningful according to the contexts of its deployment and in research terms, it is often paradigm dependent. There are two main forms of knowledge: tacit and explicit knowledge. Organisations adopt technology as a means to access explicit knowledge, but it is unwittingly regarded by some as the panacea for the transfer process without due regard to its tacit dimension.

The research-practice relationship is influenced by several factors: for example, existing research culture, institutional position, levels of funding and membership of networks. All those interviewed were motivated to undertake research in order to have some benefit on the overall health of the population. Translating this into practice was variable, with different groups disseminating the results of their work in various ways. Publishing in peer reviewed journals was the most frequently used method because a key driver for activities is the Research Assessment Exercise (RAE). Current partnerships and collaborations were well established and based on informal social networks and clusters around particular forms of research. In terms of geographical reference, research activities vary in terms of their scale and scope

(local to international), which has implications for the form of KT that should then take place.

A lack of research funding over time affects research infrastructure, as well as the application for external funding and research strategies. This, in turn, affects the type of research that can be undertaken at varying levels of scale and with different partners. It can also be the cause of fragmentation and directly affects dissemination and the job security of research staff. Good coordination, communication and collaboration are essential for KT to work effectively.

Current research processes are shaped by institutional and departmental research cultures and those, in turn, are influenced by sources of funding: in particular, the RAE. Pre-92 universities tend to have more established and cross-disciplinary research cultures in comparison to post-92 institutions, whilst within those organisations, disciplines vary in the levels of their research activity. Variations within institutions also encompass different modus operandi in the research process itself.

Elements in the research production process include: research area; pure and applied research; funding; field research; ethics and access; methodologies; collaboration and inter-professional working; user involvement and evaluation, as well as dissemination and measurement of research impact. All researchers believed the research process is now inferior to past practices due to conflicting pressures upon the research process from organisations with different interests. In particular, those with established cultures drew attention to the lack of funds, whilst those in institutions with less established research cultures drew attention to the need to provide developmental funding. In career terms, researchers experienced difficult trajectories, but all shared the common goal of adding knowledge to their respective fields.

The profile of research needs to be raised and research viewed as a priority, with sensitivity to different types of research and scales of activity. Here the NHS can exhibit leadership through good links and communication channels with universities, according to the changing demands that are being made upon them within regions. There are a significant number of people who regard the current funding processes as unfair and the form of assessment for the next RAE is still to be decided. With regard to dissemination, there are differences in emphasis according to what is encouraged within the research culture and the form of funding itself. These differences are important to bear in mind in formulating a strategy for more effective KT.

Conclusions

KT is about the translation of work from information to intelligence according to the needs, in context, of particular groups of policy-makers, practitioners and the public at large. Key to effective KT is an understanding of cultures of enquiry and cultures of reception. Knowledge must be produced and *communicated* rather than simply transferred. It must then be actively received, understood, interpreted and acted upon. The reception of research requires more consideration than has been provided thus far. Without some understanding of use in context – which is not a one-way relation of research to practice, but also of practice informing research – KT is an activity without substantial benefit.

What this means is the need for a more context-sensitive framework for KT. KT does not take place between two separate spheres of activity, but is a space of communication where different cultures of enquiry and reception can engage. What is important in moving forward is an understanding of what methods of KT work in different contexts, for different forms of knowledge and to meet particular objectives. There is no single model or one size fits all solution.

Recommendations

KT needs a knowledge transfer intermediary and champion, supported cross-sectorally and funded by an initiative whose geography is appropriate to the scale of activity. With policy aiming to improve KT, cross-departmental bids to and initiatives from Government would demonstrate a commitment to such aims. The champion and their team should be sensitive to different organisational cultures and modes of research production. In some instances an active intermediary organisation could work to translate findings for different groups into effective intelligence. In other instances, better liaison with users of research might be built into the work at an earlier stage as long as it is properly funded and supported.

The activities of the knowledge transfer intermediary and champion would include: mapping existing work in different institutions in terms of types of research and involvement of different personnel; acting as a broker and advisor; being an active intermediary who translates and disseminates the results of work for different groups; providing a resource for research funding opportunities; bringing together otherwise disparate groups to work collaboratively for collective benefit; acting as an intelligence resource for health and research professionals in their daily practices; deploying intelligence to advise stakeholder organisations on policy and strategic directions and representing key stakeholders as leading in the field of health research knowledge transfer.

SECTION 1:
INTRODUCTION

1.1 Aims and Objectives

This project was designed to assist in developing a strategy for regional knowledge transfer (KT) between universities and the health sector. It aimed to build upon existing practices and to contribute towards the development of new opportunities and expertise for effective transfers of knowledge. Specifically, the work intended to:

1. Facilitate an improved relationship and synergy between research agendas and health and social care needs.
2. Examine the potential contribution of different areas of health and social care research in meeting these needs within organisational and integrated research strategies.
3. Explore the dynamics of the research-practice relationship in different areas of health and social care research.
4. Understand different models of knowledge transfer and their potential to underpin improved research-practice relationships.

1.2 Background

Improving the relationship between research and practice in health and social care has been identified as a key priority. The need to systematically exploit existing research and tailor agendas to improve the 'synergy' between research topics and the needs of the health and social care sector has been consistently reinforced. There is the need to deliver patient-centred healthcare through the application of latest research findings, as well as the increasing need for evidence-based decision making and a desire for cost effectiveness through improved understandings of research. The new national health research strategy 'Best Research for Best Health' (DoH 2006) sets out the Government's goals for research and development in the NHS and the aim of creating a vibrant research environment that contributes to the health and wealth of the UK.

The sub-regional or local level is widely recognised as the most appropriate for developing synergistic research agendas and implementing knowledge transfer between universities and the health sector (HEFCE/DoH 1999). This is reflected in the replication of the functions of the Strategic Learning and Research Advisory Group (StLaR) through Health and Education Strategic Partnerships (HESPs) at local level. In the 'Joint Ministerial Review of the Role of Primary Care Trusts in Relation to Learning and Research in the New NHS' (DfES/DoH/Welsh Assembly 2004), HESPs were explicitly allocated a role in developing and delivering local research strategies to address local problems and clarify roles and responsibilities between member organisations.

In recognition of the increasing importance of knowledge transfer in health and social care, a core part of the NHS research programme is dedicated to improving access to knowledge and evidence-based practice. This is primarily reflected in attempts to codify knowledge and apply access through electronic information portals. Examples include the National Knowledge Service, the National Electronic Library of Social Care, Department of Health Electronic Register of Research Findings and the

National Electronic Library for Health. Such models are dependent on the effectiveness and operation of joined up strategies and cultures within local contexts. While IT databases are also widespread outside the NHS, there are a number of alternative mechanisms for facilitating knowledge transfer, such as face-to-face interactions, knowledge intermediaries, seminars etc. However, there has been no systematic analysis of different methods of knowledge transfer in health and social care.

The higher and further education sectors are also undergoing significant transformations in relation to roles, responsibilities and expectations. This is largely connected to the development of the knowledge economy in which research, teaching, knowledge transfer and outreach to local and regional communities assume prime importance (UUK 2002). The development of the knowledge economy places universities, as major knowledge producers, at the heart of economic development processes: "as generators of new knowledge, basic and applied, research-oriented universities are to the information economy what coal mines were to the industrial economy" (Castells and Hall, 1994: 231). The production of knowledge and the application of that knowledge is a function that the university has always been well placed to fulfil, but a premium is now placed on extracting economic and social benefit from university-based knowledge. This requires significant investment in knowledge transfer activities which have previously been given insufficient attention, as highlighted by the recent House of Commons Select Committee on Research Council Support for Knowledge Transfer (2006).

The above constitute a clear rationale for the development of synergistic research **strategies** via improved understandings of the **practice** of knowledge transfer in different areas of health and social care research.

1.3 SURF's Work

The SURF Centre is an interdisciplinary research centre at the University of Salford. The Centre has expertise in a number of areas including regional and urban policy; regional, city-regional and urban governance and futures; and the role of knowledge, science, technology and innovation in regional and local economic development. Specifically, SURF has developed an extensive research agenda around universities in the knowledge economy and issues related to knowledge transfer.

In 2003 SURF was contracted to assist the Health and Education Strategic Partnership (HESP) in the Trent, East Midlands area, in the identification of its strategic priorities. Two pieces of work were carried out (available on SURF's website) to establish common understandings and clarify strategic options and to enrol and engage key stakeholders in ongoing work. The HESP identified that research and knowledge transfer were key areas where they wished to develop a distinctive approach to partnership working and subsequently, a further piece of work was commissioned by the Strategic Health Authority.

1.4 The Work Plan

The original work was divided into two phases: a literature review, including a web-based review and interviews with key actors. This is summarised below:

Table 1: Overview of Work

Phase	Aims	Activities	Outputs
Nov 2004 to Mar 2005	To provide a literature review of existing research and to provide an overview of national-level research strategies in health and social care for the main Government Departments and funding bodies.	▪ Literature analysis ▪ Desk-based research ▪ Policy scoping in relation to KT ▪ Secondary documentation	Interim Report: "Forms of Knowledge, The Knowledge Economy, Issues in Knowledge Transfer & Public Policy "
Apr to Jun 2005	To further develop an understanding of the research-practice relationship between HEIs and health and social care organisations, including PCTs and SSDs.	▪ Face-to-face interviews ▪ Telephone interviews ▪ Email Response Questionnaire ▪ Interview analysis	Interim Report: "Understanding the Research-Practice Process, Research Funding and Forms of Knowledge Transfer within Education, Health & Social Care"
Jul to Oct 2005	To develop an understanding of the dynamics of the research-practice relationship in four areas to inform the potential for more effective knowledge transfer.	▪ Face-to-face interviews ▪ Telephone interviews ▪ Interview analysis	Interim Report: "The Health Research Process in Universities"
Nov 2005 to Jan 2006	End of project report to make recommendations for a strategy for more effective KT in the health service.	▪ Interim report analysis	End of Project Report: "Regional Knowledge Transfer Between the University and Health Sectors: Production, Transmission and Reception"

1.5 Structure of Report

The original report has five sections, of which this Introduction is the first. Section two takes the reader from the more general issues surrounding the concept of knowledge to issues focused on KT, to end with a discussion of how the latter is situated within current public policy. Section three examines current research cultures in terms of their dynamics and content. Section four then explores how these research cultures shape current practices, before section five provides an overview of the main findings along with recommendations for ways forward. As noted in the Executive Summary, this is an edited version of the main report and comprises the Introduction and final sections only.

SECTION 2:
CULTURES OF ENQUIRY AND CULTURES OF RECEPTION: SUMMARY AND RECOMMENDATIONS

2.1 Introduction

The full report focussed on understanding the knowledge transfer process between the university and health sectors in order to contribute towards developing a more effective strategy and practice. Here we provide a summary of the report, followed by key recommendations for ways forward.

2.2 Summary

2.2.1 The Missing Middle: 'How To' in Knowledge Transfer

The first section of the report consisted of an academic literature review and policy analysis. It highlighted the context for the increasing importance attached to KT as well as changing knowledge production and transfer processes. It argued that there is a missing 'how to' of knowledge transfer, compounded by inadequate levels of funding and narrow conceptions of KT.

It is widely recognised that we now live in a 'knowledge economy' where knowledge is key to economic and social development, competitive success and the wealth – and health – of the nation. The role of universities as knowledge producers is increasingly valued and emphasis placed upon their relationships with businesses, governments and society in general. Accordingly, priority is being given to notions of 'social robustness', 'relevance', 'user engagement' and 'knowledge transfer'. KT has been defined as the exchange of knowledge and skills between different bodies to facilitate and strengthen links and improve practice. The importance of KT is mirrored by an increasing focus on evidence-based practice, bench-to-bedside research, applied research, technology transfer, dissemination or issues relating to intellectual property. However, whilst there is agreement that the dissemination and transfer of knowledge is essential, there are no simple solutions to making it happen. A review of the academic literature provides two reasons for this.

First, there is the distinction between tacit and explicit knowledge. Tacit knowledge is embodied and embedded in organisational, institutional and geographical contexts. It represents the culmination of years of professional experience, 'knowing in practice'. Explicit knowledge can be codified and documented and is essential as a basis for information-sharing and accessibility. In a knowledge economy both forms of knowledge are vital, particularly if knowledge is to be not only transferred, but also understood and used in practice. The distinction between tacit and explicit knowledge has three implications for KT. First, technology cannot be a panacea for the KT process. Technology can be used to access information quickly and efficiently, but explicit knowledge relates to tacit knowledge so there are limits to codification as a solution to KT. Second, proximity matters and clusters are seen as key in facilitating face-to-face contact and knowledge spill-overs. Third, if tacit knowledge is important, cultures must support KT and 'learning organisations' maintained and/or developed.

Organisational culture can act as a barrier to the KT process, and despite the benefits, difficulties are found in joint and inter-sectoral working due to professional status differences. Effective KT is dependent on sensitivity to cultures and contexts.

Second, the increasing complexity of the knowledge production process itself. The model of an 'ivory tower' university has been widely decried, if ever it existed. The research process is more complex, with multiple funders, interdisciplinarity, interactivity and a greater focus on problem-solving as opposed to 'blue skies' research. The changing research process has been described as moving from a Mode 1 of knowledge production to a new Mode 2 (Gibbons et al 1994). What this means is increasingly complex relationships between researchers, policy-makers and practitioners requiring new methods of working, interacting, producing and disseminating research. Policy-makers and researchers alike are still getting to grips with what new knowledge production processes mean for doing KT.

In this context, it is unsurprising that a review of Government policy highlights the missing 'how-to' of KT. Government departments all state an increased importance attached to KT, but this is generally seen in narrow terms, relating predominately to university-business interactions rather than relationships with, for example, the health, local government and voluntary sectors. The ODPM (now DCLG) and HM Treasury view KT through university-business collaboration as a way for regions to improve their economic growth. Emphasis is placed on licensing, protecting IP and commercialising research. The DTI and OSI believe that the UK is lagging behind other countries in terms of R&D. They continue to increase funding for KT, but this is allocated to business-university collaborations. The DfES sees KT activities as taking place between HEIs and business collaborations with the creation of spin-out companies and increases in patents. As a result, many other forms of knowledge, vital not only for wealth creation but also social benefit, are omitted.

The DoH and the NHS see KT in three main ways: technology transfer, innovation through Hubs and the management of knowledge. The NHS view technology as a possible panacea to the transfer problem with its emphasis firmly placed on IT. The NHS provides guidance for those wishing to take part in KT through the NeLH (National Electronic Library for Health) and the establishment of Hubs which link NHS organisations, industry and other partners. HEFCE (Higher Education Funding Council for England) notes the importance of KT and refers to the protection of IP (Intellectual Property) and spinout companies as examples of wealth creation. The research councils promote research into areas that will benefit the health of the nation and the importance of KT is highlighted throughout their research strategies. Allocation of funding to KT activities is often difficult to discern but projects tend to focus on licensing, commercialising research, protecting IP and the creation of spin-out or start-up companies. Lastly, research charities have begun to incorporate KT into their research strategies in line with the Government and its departments.

None of the Government departments or research funders provides clear advice on 'how to' undertake effective KT and exhibit a tendency to oversimplify the process and work on varying definitions. The increased importance attached to training KT professionals can be seen as a positive step in this respect. However, funding for KT remains low, despite positive Government assertions and incremental increases. KT has historically been assumed to happen automatically at the end of a research

process, rather than requiring continuous effort and interaction. At the same time the economic benefits of KT are held to be the most important – in terms of commercialisation, spin-outs and intellectual property - with a clear tendency to separate the economic from the social. Understanding the social dimensions of KT are fundamental to achieving economic benefits via, for example, social networks and physical proximity, effective cultures of learning, trust among partners, population health and welfare and the vital importance of cooperation in the production, transmission and reception of knowledge.

2.2.2 Research in the Health Sector

Section two of the report, based on interview data, focused on the state of research in the health sector. It highlighted limited research cultures as a key barrier to effective KT and a productive research-practice relationship. Understandings of KT and how it works are variable and not based on a shared or well-communicated research strategy.

The interviews indicate that the limited success in linking research to practice can be related to the generally low priority attached to research in health sector organisations. Reasons given for this relate to inadequate and fragmented funding streams; constant and time-consuming organisational change; inadequate institutional support; job insecurity; a lack of awareness of opportunities or research mechanisms and limited understandings of what is meant by 'research' itself. These contribute to a self-reinforcing research-averse culture. For instance, eeffective research cultures depend upon the retention of good research staff whose knowledge and skills are at a premium. Yet this is difficult to achieve with funding streams that are both short-term and reactive. The source and volume of funding is core to understanding research production and transmission. Yet current methods of funding allocation are contentious and often work to undermine good work that takes place at different scales of activity (local; city-regional; regional; national and international). It is felt that lip service is paid to research and KT in the health sector, with ad hoc commissions and research mechanisms replacing any systematic or long-term research strategy. Innovation is felt to be low, with particular methodologies being favoured over new techniques.

There is no commonly agreed definition of KT within or between sectors. There are many activities which have similar purposes and outcomes, but which are defined differently. Views on KT are also narrow with a high value placed on articles in peer-reviewed journals and low expectations of research outputs as a result of the configuration of current cultures of inquiry. Funders of research have little involvement in the research process and mechanisms for evaluation and feedback to researchers are limited. At the same time, funders do not build in, through sufficient costing, dissemination requirements that might change such practices and effective institutional divisions of labour are not geared up to such expectations. Partnerships and collaborations do exist that work effectively and there is a clear need to develop these in mutually beneficial ways and learn from them for wider benefit, particularly given the currently fragmented nature of health sector research. Those partnerships that are successful tend to be based on a prior identification of mutual interest and informal social ties.

Even where KT takes place, an absence of cultures of knowledge reception and learning reduces its effectiveness. The extent to which positive cultures of reception exist is determined in a large degree on funding streams which in turn affects infrastructural organisation and support provision. Organisations must see knowledge as valuable to practice and provide time for its consideration as a precondition for effective KT. Knowledge must be received and acted upon, as well as transferred, in a way that takes account of reception and what needs to change in those contexts to effectively inform both its consideration and subsequent deployment.

2.2.3 Health Research in Universities

Section three of the report examined the state of health research in universities. It emphasised the importance of institutional and disciplinary factors in relation to knowledge production and the dynamics that enabled or constrained effective KT. It focused upon key differences in knowledge production, transfer and use in four areas: bioscience and genomics; public health research; health services research and social care research.

The interviews demonstrate how KT processes are influenced by institutional and cultural contexts. Prime among these are sources of funding which have clear influences on the nature of activity. Some academics clearly benefited from the RAE and that enabled the funding of research infrastructures. Others felt that the RAE stifled research and downgraded local and regionally relevant activities in favour of the more abstract idea of international excellence. Depending upon the area of expertise, funding derives from very different sources at different levels of scale from local, through regional to national and international. Lack of success from the RAE and research councils causes resentment amongst researchers and was also felt to undermine collaboration and beneficial development.

Funding plays a key role in influencing methods of dissemination. The dominance of the RAE explains the high priority attached to traditional methods of KT through peer-reviewed journals. Less importance is attached to more interactive and participative relationships between the funders, producers and users of research. A very narrow idea of KT predominates. The idea of measuring research impact or influence is also problematic and varies according to the context in which the research itself is, or is not, taken up. Research impact is often seen to relate to the quality of journal articles, place of publication or number of citations or else seen as irrelevant and not the responsibility of individual researchers. Funders control much of what enters the public domain, as do the editorial decisions of journals and the companies that own them. It should also be noted that successful research is often reported because research activity is about the status of the researcher in their community and what counts as 'valid' research. Yet much can be learnt from failure, as well as success.

Culture, context, track record and likely sources of funding all inform the direction of research. There is variation both within and between institutions in terms of research intensive practices. Funding concentrates in centres of excellence and this has a self-reinforcing dynamic and influences institutional hierarchies, staff movements, retention of personnel as well as the relative ease of establishing new research areas. Other considerations are also important to the research and KT process, including

degrees of job security, short-term contract versus longer term systematic work, the time-consuming nature of ethical approval systems, issues of internal communication and institutional support and the teaching/research balance.

Differences in KT practices vary according to disciplinary, as well as institutional and cultural contexts. In particular, a clear difference emerges between the fields of biosciences and genomics and social care research. The former is largely characterized by a one-way, linear and 'arms-length' KT process, where publication in peer-reviewed journals is valued, despite the recognition that this is not particularly 'user-friendly'. Social care research, by contrast, tends to involve a more interactive and practice-oriented focus in a non-linear research process.

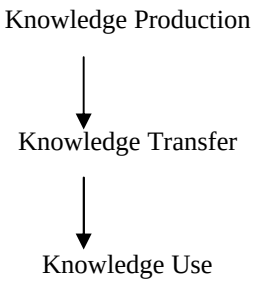
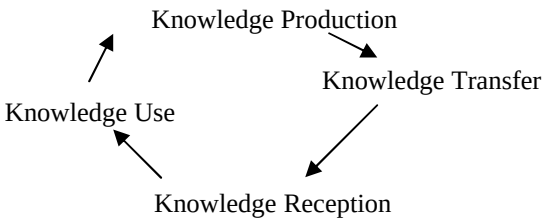
User involvement varies according to the disciplinary field and institutional context in which the research is conducted. Similarly, it was noted that collaboration between institutions and researchers is variable according to disciplinary area, with greater competition for large-scale research council funding tending to act to the detriment of partnerships. Such differences are clearly related to those factors identified previously, namely funding amounts, funding sources, and length of contracts, methodologies deployed, roles of academics and new versus established areas of research. All of the research fields examined are both relevant and of use to society. The opportunities for a meaningful KT process are heightened or diminished according to particular cultures of enquiry, as well as the institutional conditions in which knowledge is produced.

2.3 The 'Missing Middle': Effective Knowledge Transfer in Action

Knowledge transfer is not a one-way process (see Table 2). It does not have a clear start and end point or fixed boundaries between funders, users and producers of research. It is about the active translation of work from information to intelligence according to the needs, in context, of particular groups of policy-makers, practitioners and the public at large. KT is not the 'dull thud' of a report at the end of the research period. The product of research is only as good as the process that has informed its production. This means a continuous relationship between research participants and interactive user involvement in which differences in divisions of labour are recognised and negotiated. KT is not a hypodermic process that involves the injection of knowledge into recipients.

KT is complex and needs active commitment, work and institutional support to be effective in ensuring that good research feeds into practices. There are no short-cuts or simple remedies. Demanding changes at one end of the research spectrum is not a solution for the credibility of research can easily be undermined by demanding that it is immediately applicable. Much research becomes of importance only after time because its value is seen in a different context according to a different purpose. Equally, there is a great deal that can be done to render current research of far greater applicability and value. This process should be informed by the changing role of knowledges in society according to the needs of different stakeholders and communities.

Table 2:
Knowledge and its Transfer

Traditional Mode	Emerging Mode
Knowledge is driven by individual and professional interests	Problems are defined and set jointly by stakeholders
Knowledge is produced by academics and then transferred in a linear process to 'users'	Knowledge is co-produced with continuous and interactive relationships between producers and funders and users
Knowledge tends to be codified	Knowledge is communicated and it is recognised also to be tacit, embedded and embodied
Dominant methods of knowledge transfer tends to include report writing, articles, etc	There are varied mechanisms for knowledge transfer which include presentations, seminars, placements, job-sharing, workshops, multi-media etc
Knowledge provides information to funders and users that can be stored, retrieved and referred to	Knowledge is also stored by also retrieved according to intelligence that is then incorporated into organisational cultures and practices
Knowledge transfer is passive, contained and static	Knowledge transfer is active, fluid and dynamic
	

(Source, authors, drawing on Gibbons *et al* 1994)

Key to effective KT is an understanding of cultures of enquiry and cultures of reception. Knowledge must be produced and *communicated* rather than simply transferred. It must then be actively received, understood, interpreted and acted upon. The reception of research requires more consideration than has been provided thus far. Without some understanding of use in context – which is not a one-way relation of research to practice, but also of practice informing research – KT is an activity without substantial benefit.

Core constraints on the KT process have been identified. These relate to: the absence of joined up thinking from government departments; funding sources, volumes and expectations; staff recruitment, retention and skills; institutional support and divisions of labour; infrastructure enabling development and the building of capacity; the implications of deploying different methodologies; issues of scale in knowledge production; degrees of partnership and collaboration and the embeddedness of organisational learning mechanisms. These are important in facilitating KT both in terms of knowledge production and knowledge use or uptake within producing and receiving organisations. Understanding particular cultures of enquiry and reception is vital to seeing how KT takes place and where it works well. This context sensitivity has been shown to be particularly important in relation to different disciplines: in

other words, the conditions in which the knowledge itself is produced are important in shaping and determining appropriate and effective KT (see Table 3).

Table 3:
Key Differences in Knowledge Production, Transfer and Use in Emblematic Disciplinary Areas

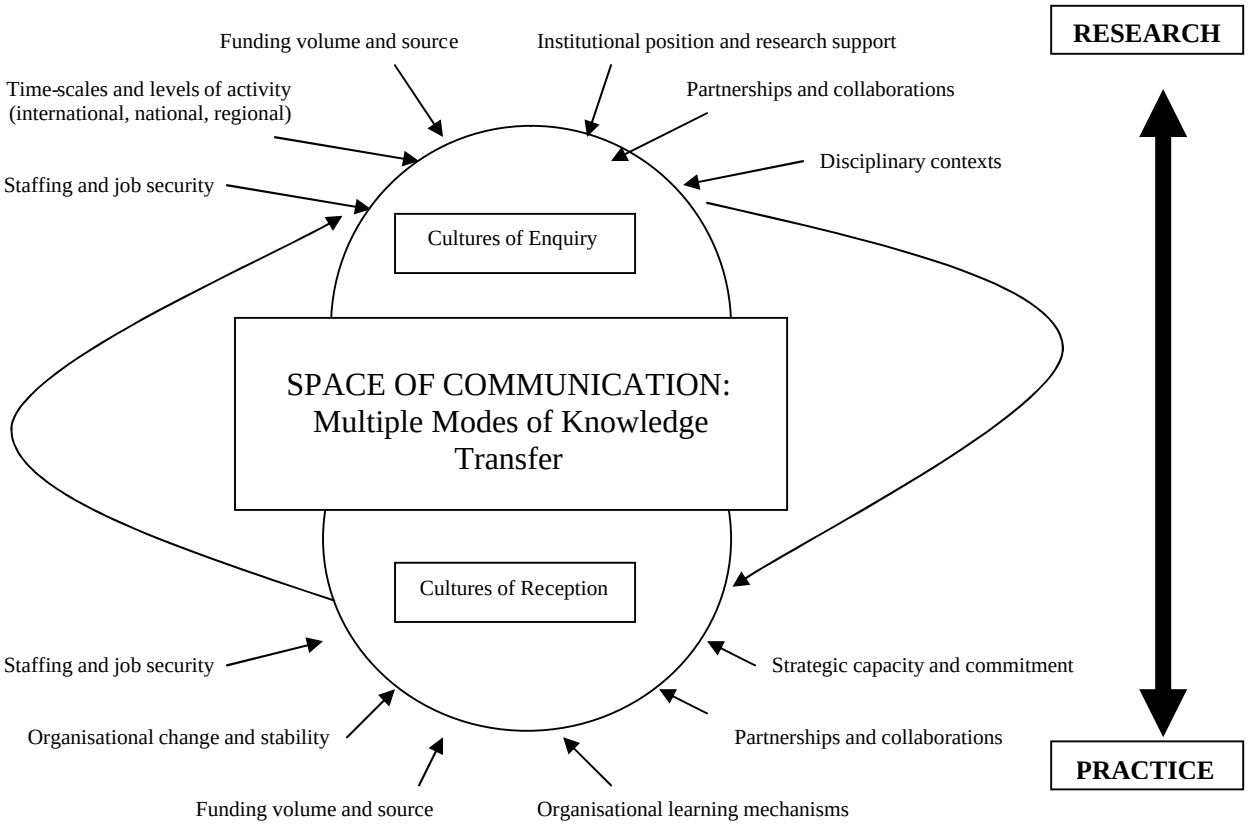
	Bioscience/genomics	**Social Care**
Funding amounts	Large	Smaller
Funders of research	Research Councils, RAE and large medical charities / organisations	Research Councils and Voluntary sector, but also regional and local agencies and felt not to be 'RAEable'
Nature of work	Tendency to long-term research projects in established areas	Shorter work, including consultancies, tending to take place in embryonic research fields
Location of study	Laboratory-based	Institutional, but also social settings and organisations
Preferred methodologies	Experiment and Design	Quantitative and Qualitative
Favoured methods of KT	Writing in peer-reviewed journals; reports	Reports as well as journal articles
Relevance to…	The 'general' health of the population	'Specific' communities and groups
Users of research	Tendency to less direct contact with users	Contact through methodologies deployed (interviews, focus groups) and management of research (steering groups)

The table takes tendencies within particular disciplines in order to illustrate differences. However, it should be noted that patients may be directly involved in experimental trials, whilst social care research can equally exhibit a distance from users, depending upon how that term is defined. What this means is the need for a more context-sensitive framework for KT that takes account of such differences (see Figure 1).

KT does not take place between two separate spheres of activity, but is a space of communication where different cultures of enquiry and reception can engage. Importantly, the framework also points to a continued degree of independence between research and practice or 'zones of non-interference'. First, there are justifiable limits to which policy-makers and practitioners should seek to direct or manage different types of research without undermining its credibility. Second, there are also limits to the extent of a researcher's responsibility for the ultimate interpretation and use of their work. The 'missing middle' in KT is the expectations placed upon all stakeholders in research without a mutual understanding being developed. Whilst this framework can be seen in action more clearly in certain fields of research, this should not be overstated. Different methods of KT continue to co-exist. Generally this research has found that understandings of KT remain narrow and of low priority, with publication in peer-reviewed journals still valued highly by funders and producers of research, despite recognition of the limits of this approach. What is important in moving forward is an understanding of what methods of KT work in different contexts, for different forms of knowledge and to meet particular

objectives and at what different time periods. There is no single model or one size fits all solution to KT. Figure 1 seeks to encapsulate the dynamics of this process.

Figure 1:
A Context-Sensitive Framework For KT



2.4 Recommendations: The Space of Communication

If KT is to be effective, it needs to be taken seriously. This means recognising that there is no single model that can be applied to ensure that good research leads to improved practice. A key issue is improving both cultures of enquiry and cultures of reception in relation to KT and appreciating that context-sensitivity is central.

We turn in this last section to the recommendations for future actions in order to develop a KT strategy between universities and the health sector. The most important point being that there is effective coordination, communication and support between the organisations concerned within a well developed government cross-departmental framework. The key recommendation of this report is that KT is best managed through a dedicated knowledge transfer intermediary organisation, with a nominated champion, between the universities and the health sector.

2.4.1 *Knowledge Transfer in Action: An Active Intermediary*

There are going to be many organisations involved in a KT strategy and the various combinations of partnerships between the universities and health and social care sector organisations will need management, coordination and above all, tangible support from the principal organisations. The absence of such activity and named personnel with the appropriate understanding, will run the risk of becoming unorganised and ineffective.

An organisation needs to be funded and formed which has a clear sense of purpose in acting as an intermediary between sites of research production and reception at an appropriate level of scale. In the first instance, this would be at the regional scale with delegations to other levels as deemed appropriate. A champion needs to be appointed, with a team of support staff who has the full institutional backing and authority from the principal steering organisations who, in turn, should have an oversight relationship to its activities through a steering group. Steering group organisations would need to appoint suitable contact persons to liaise with the main group, otherwise the burden of work will become too great and instead of embedding such practices in organisation, they will be passed on to others who are not enabled to take the work forward.

Steering group organisations should second suitably qualified and supportive personnel for sufficient time periods (6 months) to enable a team of staff to establish an infrastructure that is effective and sustainable over a period of time. These staff need to belong to the relevant profession and embody the tacit knowledge that is required for effective translation. Different organisations will be involved and context-sensitivity is necessary for effectiveness. In some instances, active translation will be needed in order to take the results of research and turn them into useful knowledge. That means the skills and knowledge base of organisational personnel will be paramount. In other instances, acting as a broker and advisor between producer and user groups would enable better contacts to be established.

The roles of the active intermediary would include:

- mapping existing work in different institutions in terms of types of research and involvement of different personnel;
- acting as a bridge between organisations, identifying gaps and strengths;
- acting as a broker and advisor;
- translating and disseminating the results of work for different groups;
- providing a resource for identifying research funding opportunities;
- bringing together otherwise disparate groups to work collaboratively for collective benefit;
- acting, in partnership, as an intelligence resource for health and research professionals in their daily practices;
- deploying intelligence to advise stakeholder organisations on policy and strategic directions;
- representing the region or appropriate sub-regions as leaders in particular field of health research knowledge transfer.

2.4.2 The Task Ahead: Consolidation, Representation, Addition and Transformation

The work of the knowledge intermediary will fall into four (not mutually exclusive) phases.

Consolidation and Consensus-Building

A KT strategy is needed that is meaningful at different levels (local to regional), using realistic time-scales, of what will be achieved and by when. This means:

- visiting organisations, finding suitable contact points and gaining and more in-depth intelligence of issues and opportunities
- developing an understanding of the current strengths and weaknesses of research that draws upon and extends work that may have already been undertaken.
- forming a consensus on the need for this activity and engaging key stakeholders. Key here is establishing common values about the purpose, processes and products of a KT strategy and identifying the limits and scope of activity.

The strategy cannot be 'top down, but must also be 'bottom up' with a period of time allowed for a commitment to participation based on good organisation and communication. Key questions must be addressed: what should be transferred, to whom, by whom, how and with what desired effects? (Lavis *et al* 2003)

Representing Research Strengths

The KT strategy and work of the knowledge intermediary should act as an effective focus through which current research is channelled, magnified and given an interpretation according to the relationship between actual and potential activities and the distinctiveness it wishes to convey. This means better representing existing research strengths and their benefit to practice. The profile of research needs to be raised, with research being viewed as a greater priority. It is here that there is a role and use for technology. A database can be formed that includes not only studies generated within the geographical area and beyond, but also a more accessible directory of expertise that enables academics to gain direct access to support and vice versa. If it is decided that technology is to be used to support a KT strategy, then the champion needs to ensure that organisations involved have access to and the skills to use such technologies and it is appropriate to the task. Issues of access, ease of use, intelligibility and concern for context need to be understood.

Adding to the Stock of Knowledge and Improving Practice

The work of the knowledge intermediary needs to add value to existing activities, identify opportunities that are not normally part of everyday practices and add to those in significant ways. This is not just about commercial spin-out opportunities in collaboration with NHS Innovation Hubs. Indeed, as is clear from the work of the hubs so far, many innovations produce considerable cost-savings through improved practices, but are not amenable to a commercial model of exploitation. Knowledge should be transmitted and deployed in a way that is useful to clients. New evaluation

systems that include practitioner representatives need to be put in place to assess effectiveness and review practice in the light of overall aims. The key here is to best maximise the KT opportunities relating to existing knowledge. A precondition for this is to provide practical help to address those limitations and barriers in current cultures of enquiry and reception that hinder KT.

Organisations that are relatively new to the research process need help to develop their research strategies and widen their research processes. At the same time, there needs to be promotion and incentives for HEIs and organisations undertaking research within health and social care to work more systematically together in order to learn from each other. This means that the proposed knowledge intermediary would draw upon expertise within the health and HEI sectors to put on appropriate courses and seminars for this purpose. It also means that institutional reward and incentive structures will need examination in the light of such expectations.

Transforming The KT Processes

The knowledge transfer intermediary should act as a catalyst identifying current activities and re-configuring and adding to those for the benefit of the city-region/region and beyond. It should position the area as a significant leader in this field and work to change practices which need transforming, but also understand those that are working well and translate the lessons for others so there is not unnecessary duplication of activity. Key here is a focus on user friendly ways of disseminating research findings with the needs of various users in mind. Issues of translation, noted above, are very important in this respect. An important tool is periods of secondment between organisations in order that there is a transfer of experiences and knowledge between organisations. Seminars and workshops on KT and the research process should also be run in different areas in order that issues of knowledge reception are addressed, but these events are not a substitute for embedding effective processes over time.

2.4.3 Meaningful Scales for Action

Previous SURF work has identified the importance of scale and joined-up thinking for the formulation of intelligent policy (SURF 2003, 2004, 2006). The current reorganisation of the NHS and consolidation of Primary Care Trusts and Strategic Health Authorities again raises the question of the appropriate level of activity for KT work. In this context, this report sees virtue in starting the activities of a knowledge transfer intermediary at the regional level. Acting together for mutual benefit with the SHAs will lead to economies of scale and enable resources to be bid for in ways that position all concerned as beneficiaries. This will be more visible to Government policy-makers and the EC and attract private and voluntary partners. An enlarged scale of operation would require that more organisations are brought on board and the overall aim not undermined as a result of an absence of effective leadership because of a lack of joined up working. Representatives may not know what is undertaken in their institution and it should not be forgotten that much work is excellent and useful, but simply not known.

A successful KT strategy cannot be developed in a short time period. This requires intelligent policy-making. Our research has highlighted key factors in the

effectiveness of KT between universities and the health sector and made a series of recommendations for ways forward. It provides a basis from which an effective and distinct KT strategy can be built and organisations developed that add value to existing practices for collective benefit.

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